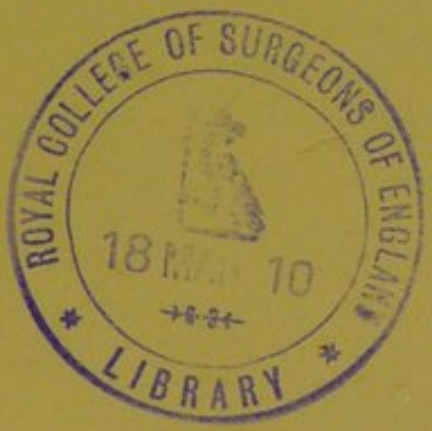
Some points about the temperature and course of infective endocarditis / by Herbert French.

From "THE PRACTITIONER" *for December*, 1904.

SOME POINTS ABOUT THE TEMPERATURE AND COURSE OF INFECTIVE ENDOCARDITIS.

BY HERBERT FRENCH, M.A., M.D. (OXON.), M.R.C.P. (LOND.),
Medical Registrar, Guy's Hospital.



From "THE PRACTITIONER" *for December*, 1904.

SOME POINTS ABOUT THE TEMPERATURE AND COURSE OF INFECTIVE ENDOCARDITIS.

BY HERBERT FRENCH, M.A., M.D. (OXON.), M.R.C.P. (LOND.),
Medical Registrar, Guy's Hospital.

"THE PRACTITIONER," LIMITED,
149, STRAND, W.C.

SOME POINTS ABOUT THE TEMPERATURE AND COURSE OF INFECTIVE ENDOCARDITIS.

By HERBERT FRENCH, M.A., M.D. (Oxon.), M.R.C.P. (Lond.),
Medical Registrar, Guy's Hospital.

THERE is a tendency, for some reason or other, at any rate amongst students and those going up for examinations, to try and include all cases of infective endocarditis under two clinical types; namely, the *septic* or *pyæmic*, on the one hand, and the *typhoid* on the other. The description of these two types, as given by Dr. Dreschfeld, in Allbutt's *System of Medicine*, is as follows:—

"The *septic or pyæmic type*, which is noticed in puerperal cases and in other forms of septicæmia and pyæmia, includes all the symptoms of a severe septic infection. The onset is acute; with or without preceding general malaise the disease is ushered in by more or less severe rigors, followed by heat and sweating, which may be repeated after a shorter or longer interval; between the rigors the temperature generally remains high, it may, however, be remittent; the skin may show patches of erythema, hæmorrhage, or superficial collections of pus; the pulse is quick and feeble; the respiration is hurried and superficial; nervous symptoms, such as headache, delirium, and somnolence, are usually present; at times symptoms of cerebral embolism may appear; the tongue is usually furred, and may become dry and brown; there may be great thirst, anorexia, and vomiting, and there is often a good deal of tympanites and diarrhœa. Metastatic abscesses may form in various organs and tissues, but often do not give rise to definite symptoms, as, for example, in the lungs.

"The examination of the heart may reveal either no abnormal signs, or audible murmurs; from their presence alone we may not conclude that we have to do with infective endocarditis, for such murmurs are not uncommon in simple cases of pyæmia and septicæmia, without any ulceration of the valves of the heart. Of other symptoms common in ordinary pyæmia I may mention albuminuria, jaundice, and pain and swelling of the

joints with suppuration. Death generally takes place within one or two weeks.

"In the *typhoid type* infective endocarditis resembles enteric fever as regards the general aspect of the patient, the condition of the tongue, which is brown, dry, and furred, the presence of diarrhœa and cerebral symptoms; but we not unfrequently see rigors, petechiæ, and optic neuritis—symptoms which are very rare in enteric fever: the heart symptoms in this form again may be absent or indefinite. The temperature is generally very irregular; rigors may occur throughout the whole duration of the disease, followed by profuse sweating; and attacks of embolism in the brain, kidney, and spleen are not uncommon. The duration of the disease, when assuming this form, varies from two to three weeks; sometimes it lasts longer."

The picture so far is one of acuteness, severity, rapid fatality; and in examination-papers the picture almost always stops here; whereas in the wards of a general hospital but few of the patients suffering from infective endocarditis present either pyæmic or typhoid characters, nor do they die so rapidly as within two or three weeks. The majority belong to quite another group, styled by Dr. Dreschfeld, in his continuation of the above article, the *cardiac type*. The patients have often had rheumatic fever previously, and may or may not have had cardiac symptoms in previous years. Presently they again come to the physician with signs and symptoms of failing cardiac compensation, and at first it may be almost impossible to say that their failing compensation is not "simple."

In this connection it is remarkable how many cases of fungating valvulitis supervene upon already existing fibrotic valve-lesions, a fact which often makes it all the more difficult to decide the nature of the affection, and the prognosis.

The question of the bacteriology of simple and fungating endocarditis is a vexed one, but two issues seem clear. The first of these is that a variety of organisms—streptococci, staphylococci, gonococci, pneumococci, typhoid bacilli, tubercle-bacilli, and possibly others—may attack previously healthy valves and cause endocarditis, fungating from the beginning; such cases are possibly rarer nowadays than formerly, just as pyæmia and septicæmia are themselves rarer, owing to aseptic

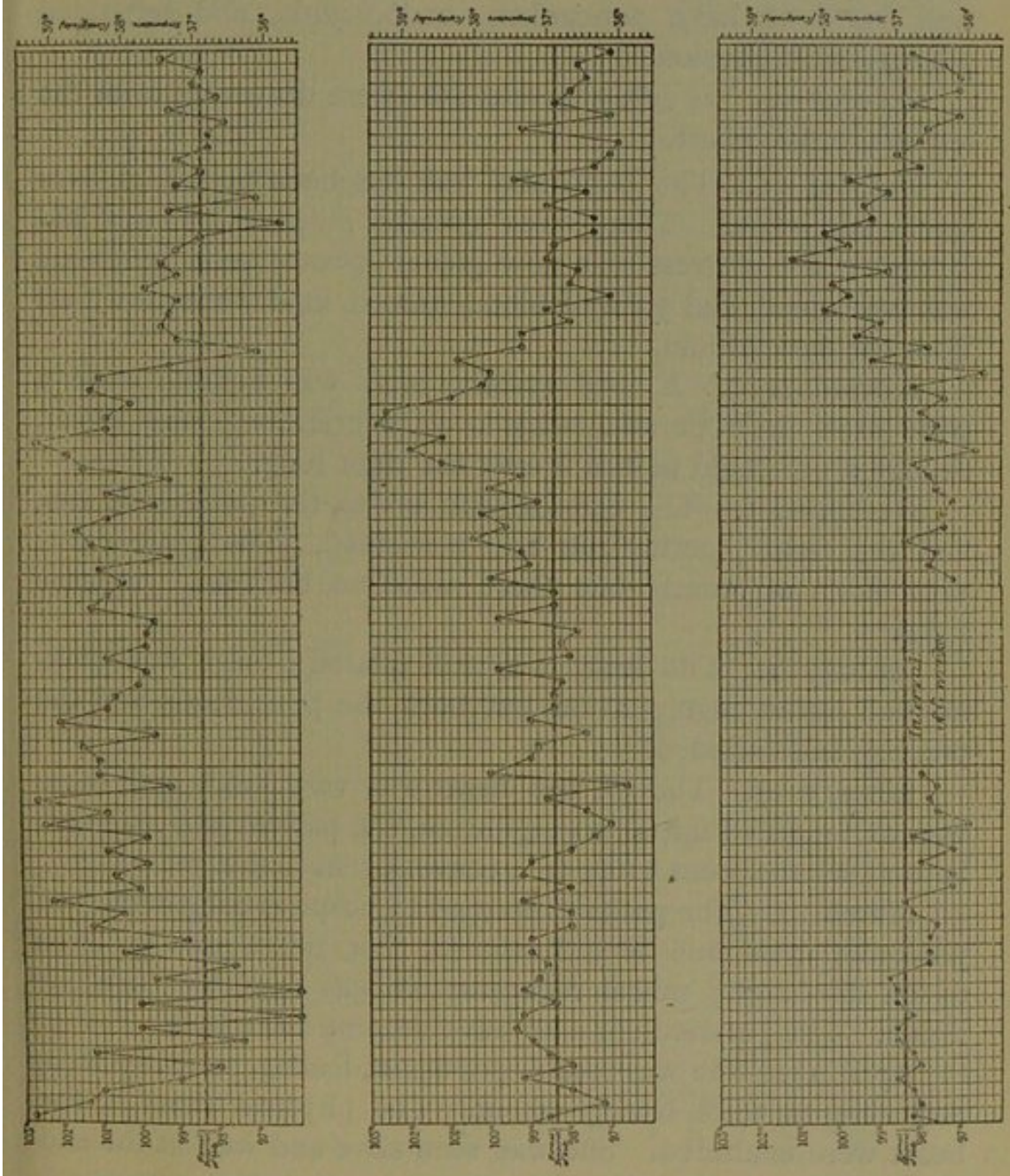
and antiseptic measures of every kind; they are presumably the cases which give rise to the rarer septic or pyæmic, and to some of the typhoid, types of the disease. The second is, that "simple" endocarditis is also associated with an organism, thought by Poynton, Payne, and others to be specific, and termed by them the diplococcus rheumaticus. This being so, the old distinction between "simple" on the one hand, and "infective" on the other, loses much of its significance. A third issue cannot be answered so definitely, although definite beliefs are held by many upon the subject; and that is, whether this organism, this diplococcus found in "simple" rheumatic endocarditis, is or is not the cause of many cases of "infective" or "fungating" endocarditis. It seems likely that in some cases other varieties of microörganisms, for example, staphylococci or streptococci, may attack old fibrosed heart-valves, and cause fungating endocarditis: in which case the symptoms might conform with the "septic" or the "typhoid" types; but there is much experimental evidence to show that the same diplococcus which at one time causes "simple" inflammation followed by fibrosis and recovery, may at other times cause fungating endocarditis with its typical post-mortem appearances. It boots little at present to discuss whether this diplococcus be specific, or whether it be but a variety of streptococcus; the point which has been more or less settled is that under different circumstances the same organism may produce either a slight inflammation of the valves which recover with fibrosis, or a severe valvulitis with fungating masses and destruction. The difference between the two processes would thus become one of degree only, and it is not surprising that it is often difficult to tell which one has to deal with in a given patient. The organisms attack a human heart-valve; there is a general reaction on the part of the human being, or a local one in the valve, or both; in one case the attack of the organism is repulsed, the valve recovers with more or less damage to itself; in another case, the reaction is insufficient, the organism continues its assault, and kills the man; in a third group of cases the balance is more even, now the attacking organism gains a little ground, now the reaction of the human being wins a little back, and the attack and the defence continue for weeks and months

until either the human being or organism finally wins the day. In a previous attack the valve may have recovered; months or years after, organisms again attack the same place and are too strong to be beaten off; fungating endocarditis may thus be, and indeed quite frequently is, ingrafted upon valves fibrosed as a result of older inflammation; whether or not the diplococcus rheumaticus is the organism alone concerned in many of these cases, or whether others are present too, is yet undecided; the point is that the line of demarcation between "simple" and "fungating" endocarditis is sometimes almost imperceptible; that cases intermediate between the two extremes are not at all uncommon; that in an apparently bad case, clinically "infective," recovery may ensue; that some cases may continue, now a little better, now a little worse, for weeks and months; that it is therefore very difficult sometimes to say when a patient with bad heart-disease has fungating masses of fibrin and organisms upon his valves, and when his symptoms are merely due to failure of the muscle to compensate for the crippled condition of the fibrosed valves. There is nothing new in this, it has long been in the books; but the pyæmic and the typhoid types of the disease seem to loom unduly large; it therefore seems worth while to illustrate once more, by notes and temperature-charts, a few cases of this other, and I believe larger, group in which the symptoms are mainly *cardiac*.

All the following cases were in the wards of Guy's Hospital during the same year, 1903; the infective case which recovered was under the care of Dr. Newton Pitt; all the remainder were under the charge of Sir Cooper Perry; to both of whom I am indebted for leave to use illustrative notes from their reports.

The first two were of special interest because the patients lay in beds almost adjacent at the same time, and their temperature charts were compared with one another day by day. It is always a suspicious sign when a patient with valvular heart-disease has pyrexia, whatever the character of the chart may be. As will be seen presently, infective endocarditis may continue for weeks and months without any pyrexia at all; but the converse is not common. An endocarditis with a prolonged irregular temperature-chart is very suggestive of

infective trouble. However, the following case of Catherine O'C., aged 16, is an example of recovery in spite of endocarditis with many weeks of pyrexia. She was very severely attacked by the rheumatic organisms, but she never exhibited the anæmia nor the multiple emboli which are further aids in diagnosing fungating valvulitis. She was a border-line case between "simple" and "infective," and ultimately shook off the infection, recovered completely, and is alive now. Her temperature chart is the following :—



Illustrating prolonged rheumatic infection and pyrexia, with recovery.

Her clinical history was briefly thus :—

Duration of illness before admission, 10 days.

Duration of illness in ward (*vide* Chart), 167 days.

Total duration of illness up to convalescence, 177 days, or over six months.

She had never been ill before. Her joint pains began on October 1 ; on October 2 she was "burning hot and could hardly move." She was admitted on October 11 for præcordial pain and shortness of breath, the joint pains being less. She was found to have pericarditis, endocarditis, and left-sided pleurisy with effusion.

October 12. 26 ozs. of serous fluid were drawn off from the left side of the chest.

October 31. The pericardial rub has been persistent ever since admission. There was greatly increased pericardial dulness ; her distress was now great ; paracentesis pericardii was performed, and ʒ vii. of blood-stained fluid were drawn off from the pericardium.

November 5. A loud systolic bruit was audible over a wide area in front and behind. Her breathing was easier, though a rub could be heard over the right lung.

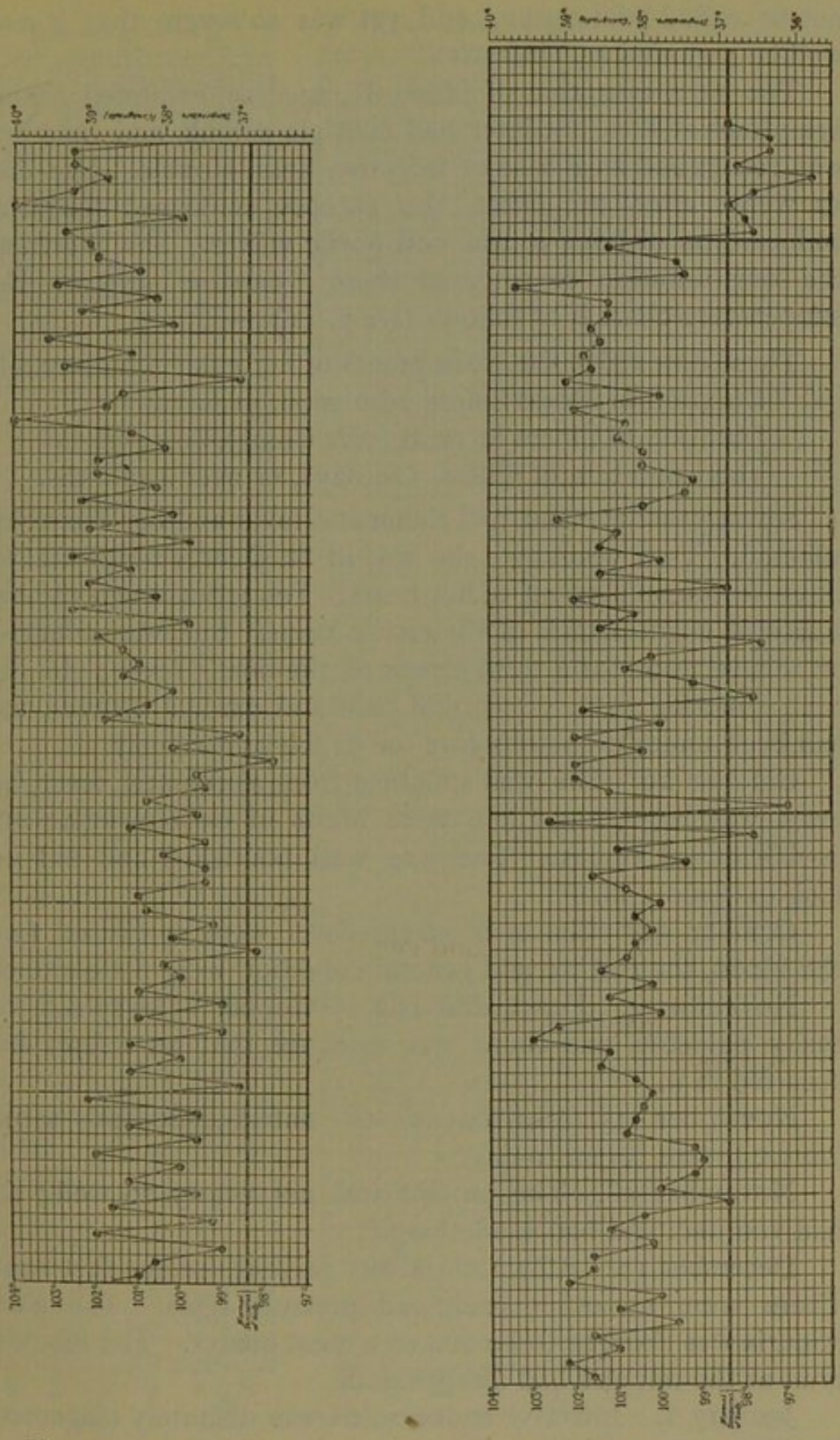
December 1. The endocarditic bruits, the pericardial rub, and the right pleuritic rub still continued. The patient was very short of breath, but there were no backward pressure signs.

January 1. The heart was still dilated ; there was well-marked mitral regurgitation, but both the pericarditis and the pleurisy had subsided.

January 27. Though the heart was very large and there was well-marked mitral regurgitation, the patient was so much better that she went away to a convalescent home.

March 10. The patient returned to hospital complaining of precordial pain and breathlessness : her heart was as large as on discharge ; mitral regurgitation was the chief valvular lesion. The pericardium may have become adherent.

April 17. She was discharged again, feeling perfectly well, and able to walk briskly about. The physical signs in the heart were unaltered. She was seen alive and well at the end of the year. At no time was there splenic enlargement nor any evidence of embolism ; so the case was one which could



Illustrating the long duration of a fungating endocarditis of the cardiac type.

not be called "fungating," and yet was so severe that it may well be regarded as "infective."

The next case, that of Hilda P., aged 19, exhibited similar symptoms at first, but later had multiple emboli, and therefore was recognised as a case of infective heart-trouble. She died 17 weeks after the onset, the autopsy confirmed fungating endocarditis of both mitral and aortic valves. She illustrates the long duration of some of these "cardiac" cases. Her temperature-chart is as follows (*see* p. 11) :—

These notes give the main points of her clinical history :—

Duration of illness before admission, 31 days.

Duration of illness in ward (*vide* Chart), 89 days.

Total duration of illness, 120 days, or over 4 months.

Seven years ago she had rheumatic fever and her heart was affected. Two years ago she was in St. George's Hospital for three weeks on account of her heart. Ten months ago she had a second slight attack of rheumatic pains. She was admitted on this occasion for a third attack of rheumatic fever ; she had been suffering from præcordial pain and cardiac distress, and had been under a doctor's care for 31 days previously.

October 20. She was suffering from rheumatic fever, her heart was large, and there were bruits of double aortic and double mitral disease. She was well nourished and did not look extremely ill.

October 31. Chains of streptococci were cultivated from the blood, the cardiac and general condition were little altered.

November 4. Pericarditis had developed. The spleen was easily palpable, and there was evidence that an infarct had occurred in it.

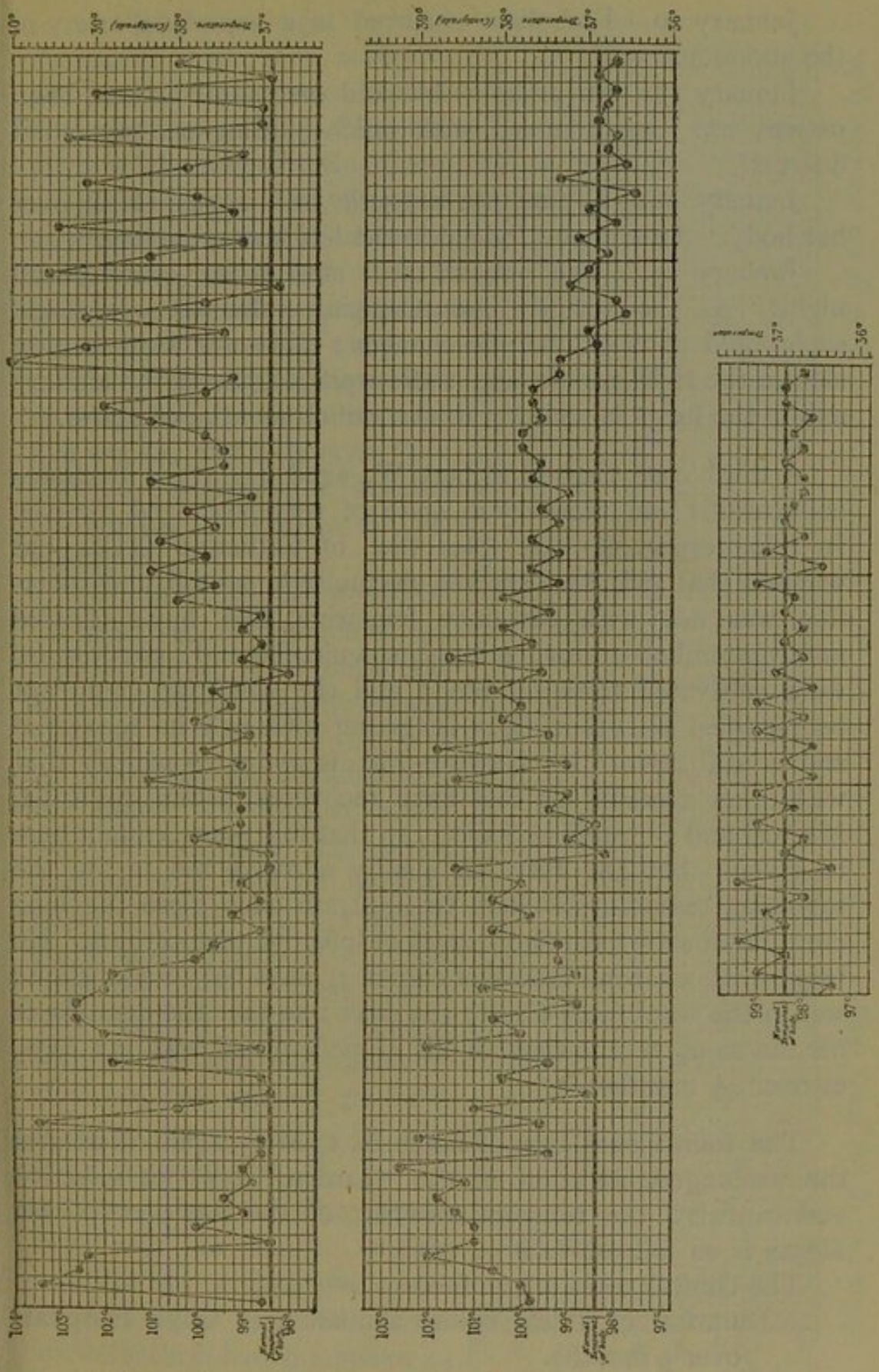
November 15. Injections of antistreptococcal serum (10 c.c.) were begun to-day.

November 28. The patient was not nearly so well ; she had vomited, and become lethargic.

December 19. Albuminuria was present for the first time. There were no other backward pressure signs. The albuminuria was thought to be due to a renal infarct. The diastolic bruit at the impulse had disappeared.

January 1. Infective endocarditis was definitely diagnosed. Cough was very troublesome.

January 7. Another infarct in the spleen was recognised.



Illustrating a prolonged infective endocarditis case, with ultimate recovery.

January 10. Embolism occurred in a superficial artery in the abdominal wall.

January 17. An embolus blocked one nasal artery. The patient was very ill indeed, with much panting and precordial distress.

January 18. A punctate purpuric rash appeared all over her body. An embolus lodged in the left femoral artery.

January 19. The patient died, after being comatose all night. At the autopsy the fungating valvulitis was found superposed upon old fibrotic changes; there was ante-mortem clot in the right auricle, and there were infarcts in the kidneys and in the lungs in addition to the emboli mentioned above.

A third case, that of Robert W., aged 13, again illustrates endocarditis and recovery in spite of very prolonged pyrexia. In this respect it resembles that of Catherine O'C.; but whereas that girl's case showed no multiple emboli, and therefore was not with certainty fungating, this boy's showed multiple emboli (renal, cerebral, splenic, femoral), streptococci were cultivated from his blood, and the condition could not be regarded as other than fungating although he recovered and is still alive. Dr. Newton Pitt is about to publish this, with other cases of his that have recovered, before the Royal Medical and Chirurgical Society, so that full notes cannot here be given; but Dr. Pitt has kindly allowed me to use the following temperature-chart to illustrate once more the long duration of such "cardiac" cases of infective endocarditis. He began with a second attack of chorea 27 days before admission; was in the ward (*vide* Chart) 105 days; so that the duration of his illness up to the time of his convalescence was 132 days, or over 4½ months.

The fourth case, that of Louis B., aged 33, again illustrates the prolonged duration of the "cardiac" type of infective endocarditis: the temperature-chart of the last part of his illness is as follows (*see* p. 13):—

The clinical notes are as follows:—

Duration of illness before admission to Guy's Hospital over 5 months.

Duration of illness in ward (*vide* Chart), 6½ weeks.

Total duration of final illness, about 7 months.

Sixteen years ago he had rheumatic fever very severely, and after it his heart was affected. He was then in Guy's Hospital for 16 weeks under Dr. Goodhart.

Eight years ago he had another bad attack of rheumatism, having also had several twinges in the intervening years; his heart troubled him much.

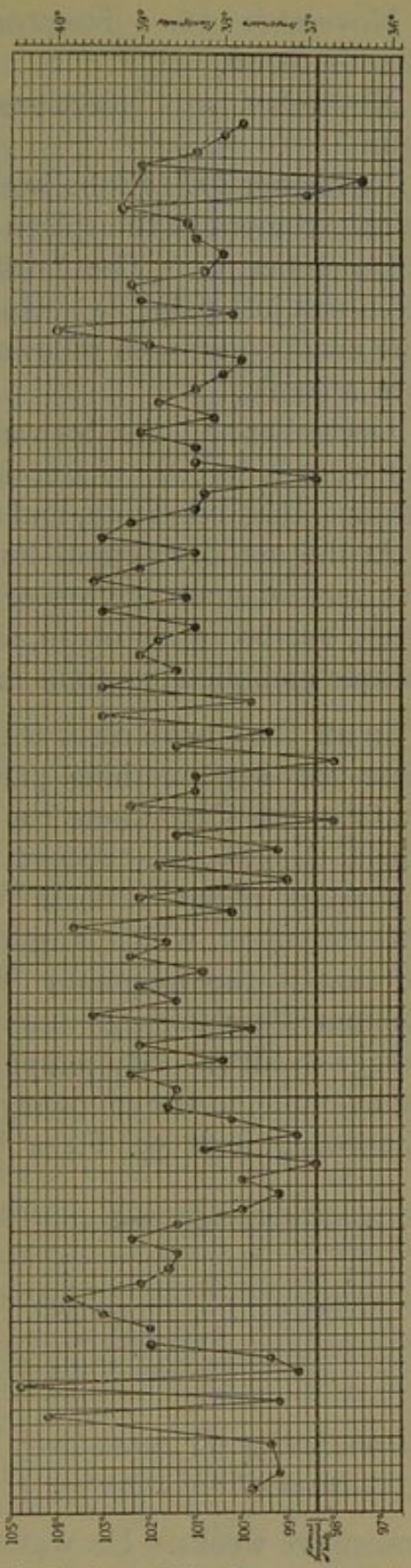
Two years ago he again had a relapse and was in bed for five weeks; and it is since then that he has noticed a decided change for the worse in his condition.

Five months ago he noticed his heart becoming much worse, and it made so much noise that it actually kept his wife awake at night.

November 4. On admission the lesion was mainly aortic regurgitation, and the aortic diastolic bruit, loud and musical, could be heard without a stethoscope at a distance of 6 inches from the chest. There was a very marked aortic diastolic thrill. He was very anæmic. Clinically he seemed to be a straightforward case of marked aortic regurgitation.

November 6. The aortic bruit was no longer audible without the stethoscope.

November 12. The aortic diastolic thrill had disappeared; and the aortic and diastolic bruit had suddenly and entirely lost its musical character.



Illustrating the final stages of a very prolonged case of fungating endocarditis of the cardiac type.

November 16. Streptococci were cultivated from the patient's blood.

November 20. Injections of antistreptococcal serum were begun.

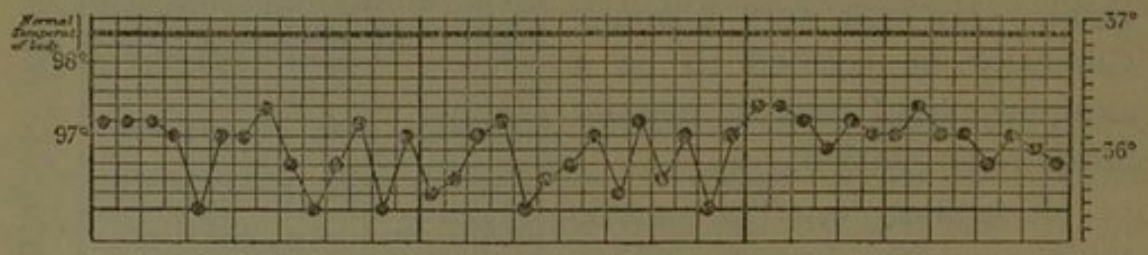
November 27. Embolism of right popliteal artery occurred. No enlargement of the spleen was detected.

December 9. The bruit had not changed again. The spleen was just palpable. He was not extremely ill, but needed to be propped up with pillows, and was becoming progressively more anæmic.

December 20. Ascites was developing, and both spleen and liver were enlarged. Later in the day he became first mildly delirious, then comatose, and died peacefully.

At the autopsy typical fungating endocarditis was found to have ensued upon the top of old fibrosed aortic valves. The spleen, but no other organ, showed infarcts. The absence of multiple embolic symptoms in this case was noteworthy.

In all the above cases there has been well-marked pyrexia. There has been nothing particularly typical about the temperature charts, but there has been pyrexia, regular or irregular, both in the cases that recovered and in those that died. There is a point about patients with old standing heart-disease, however, upon which a good deal of stress may be laid; and that is the frequency with which they seem *unable to maintain their average body temperature at* 98·4° *F.* Their average healthy body temperature is frequently much lower. For example, in the following temperature chart, that of Alfred O., aged 42, it is 97° F., or even less, over a period of three

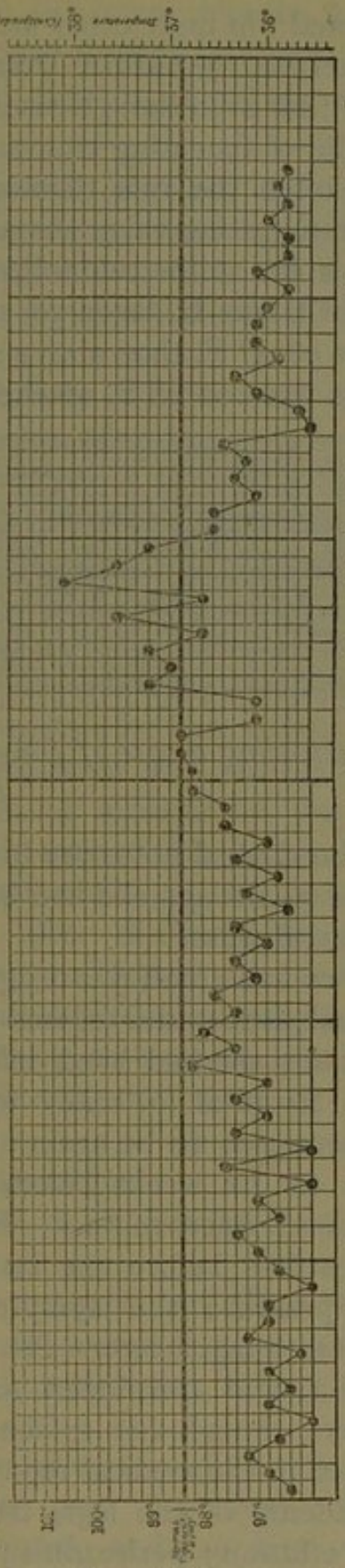


Illustrating the persistently subnormal temperature of some cases of old standing simple valvular heart disease.

consecutive weeks. He was a man suffering from old standing mitral stenosis and regurgitation, with an irregular heart that was just sufficiently compensated for him to be able to creep

about out of doors. In him a temperature of 98·4° F. would be actual pyrexia; septic trouble might develop in him without any great apparent pyrexia, a fact which one is apt to forget.

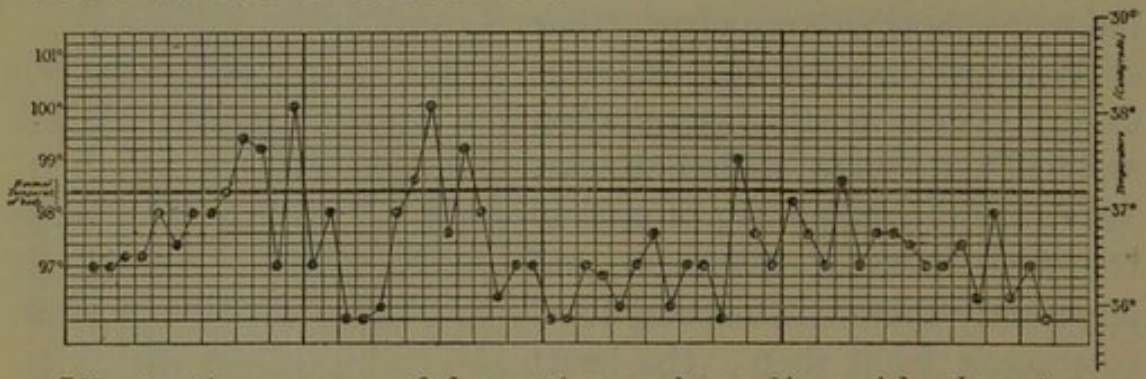
An example of heart-disease with but slight *apparent* pyrexia, accompanying an adventitious abscess in the neck, is seen in the following temperature-chart, that of William P., aged 63. He was suffering from aortic regurgitation and had had severe anginal attacks. He came in complaining of pain in the right side of his neck, but apparently there was nothing local to account for it then. His heart was fully compensated. His temperature was subnormal, averaging about 96·6° F. Slowly a local abscess gathered in the neck; the temperature rose first to what would in ordinary persons be normal, but which in him meant slight pyrexia. At the height of the local suppuration it reached 100·6° F., equivalent in another person to 102·4° F., and, after the pus was evacuated, fell again to 96·6° F., which seems to have been the mean body-temperature of this patient when he was well.



Illustrating the low temperature curve of a patient with old simple valvular disease, in whom an abscess developed elsewhere.

These two cases serve to introduce another difficulty into the diagnosis of fungating endocarditis. If the latter occur in a person suffering from old chronic valvular disease, his "normal" temperature may be 97° F., or under; in which case "pyrexia" with him may not reach above what is

"normal" in most other individuals. This may readily lead one to interpret the cardiac trouble as "simple," and not "malignant"; for even though cases with periods of actual pyrexia need not die of fungating endocarditis, as has been shown; yet it is more often the rule than not to get "temperatures" in cases where fungating valve disease is present. However, this is not always so, as the two following cases show. The first Chart, that of Dinah H., aged 20, shows more days with temperatures below 98·4° F. than above; and only on two occasions in four weeks was 100·0° F. reached:—



Illustrating a case of fungating endocarditis with almost no pyrexia.

The clinical notes are briefly these:—

Six years ago she had bad rheumatic fever which gave rise to heart disease.

Two and a half years ago she was pregnant, and developed so much ascites and œdema that premature labour was induced.

Lately she had been laid up with heart-trouble in Charing Cross Hospital for many weeks, but had recovered sufficient compensation to be again up and about; and she had been at home for six weeks before she was obliged to seek hospital treatment once more. How long she had had fungating endocarditis before she last came in is uncertain, but it was then present; the symptoms were typical notwithstanding the low temperature. She was a "cardiac" case, with little pyrexia, and developed multiple infarcts in her lungs and kidneys, though her spleen was only just palpable; she was indexed in the medical report as suffering from:—

Œdema of the legs, trunk, arms, face; ascites; pleurisy with effusion; pericarditis; mitral stenosis and regurgitation, and aortic regurgitation; dilated heart; pulmonary infarcts; albuminuria; hæmaturia; infective endocarditis.

She died a month after admission, but many months after she was last fairly well, and the autopsy showed the fungating endocarditis to have developed upon the top of old standing fibrotic valve-change.

The next and last case, that of Joseph M., aged 39, illustrates both this apyrexia, and the very long duration of some of these "cardiac" cases of fungating endocarditis. For 11 consecutive weeks the temperature remained close to the line 98·4° F. (*see* p. 18).

The clinical notes of the case are briefly thus :—

Duration of illness before admission, 180 days.

Duration of illness in ward, 117 days.

Total duration of illness, 297 days or over 10½ months.

Seventeen years ago he had his first and only attack of acute rheumatism.

Nine years ago he first had heart-symptoms, following after heavy lifting at a railway station. He recovered completely and went to sea, working as an able seaman for four years.

Six months ago his cardiac compensation broke down, and never recovered afterwards. For some months he was in the Dreadnought Seamen's Hospital, with much cough and hæmoptysis. After that he was some weeks in the London Hospital, and almost immediately after discharge he was admitted to Guy's Hospital on August 5. He was then suffering from mitral stenosis and regurgitation with irregularity of the dilated heart, and without anything to suggest infective mischief. There was precordial distress, but none of the common backward pressure signs.

August 11. Slight albuminuria appeared.

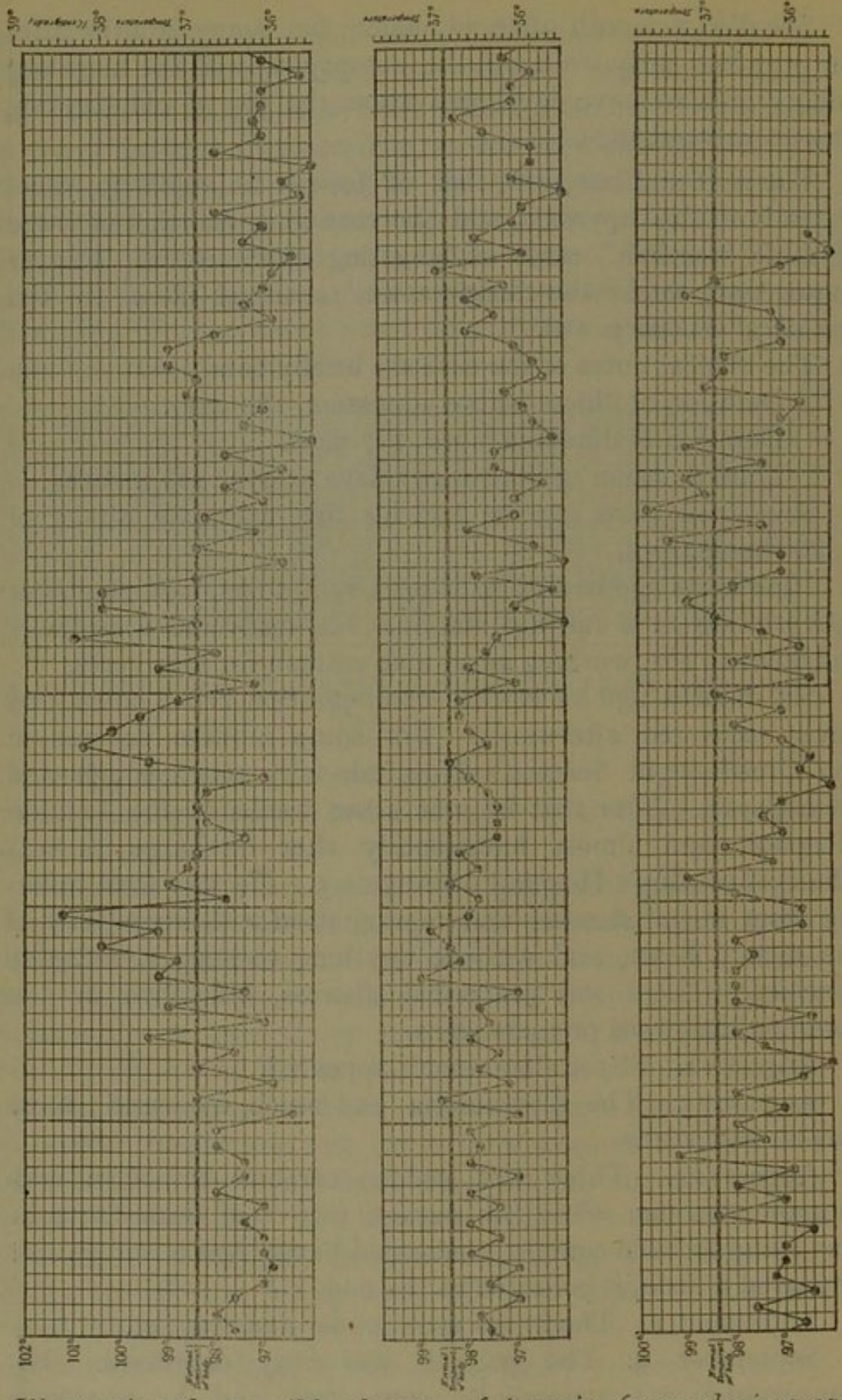
August 13. The albuminuria had much increased ; there was no hæmaturia.

August 24. There was sudden cerebral embolism with temporary coma, when the patient recovered from coma he was found to have complete left-sided hemiplegia ; though this improved a little, it persisted to the end.

September 1. The bruits were louder and rougher.

September 9. The patient was very depressed. His temperature was persistently subnormal, and he was very drowsy.

September 22. The hemiplegia was much less bad.



Illustrating the possible absence of pyrexia for weeks in a case of fungating endocarditis of the cardiac type; also the long duration of such cases.

October and November. The patient's condition continued almost unchanged. He was never able to leave his bed, but developed neither backward pressure signs nor emboli. He was always short of breath, but not acutely dyspnœic, and not very anæmic.

December 1. The patient suddenly got very much weaker, and there was increasing cyanosis, but no corresponding increase in the precordial distress or in backward pressure-signs.

December 3. The patient became almost black from cyanosis, and died during the night.

At the autopsy both mitral and aortic valves were fibrous and sclerosed, and there were large fungating masses on the mitral. The spleen was not very large. There were infarcts, old and recent, in both kidneys and spleen; and there was cerebral softening secondary to an embolism in the right middle cerebral artery.

The above cases, all occurring in the same hospital in the same year, and all but one of them under the same physician, serve to illustrate certain points which it is the object of this short paper to lay stress upon. These points are not new, but they do not seem to be strongly enough insisted upon in some text-book descriptions of the disease. Briefly they are as follows:—

(1.) That, in addition to the pyæmic and the typhoid types of infective endocarditis, there is a third and important one, the cardiac type.

(2.) That in this type the duration may be comparatively long—months rather than weeks.

(3.) That it is often difficult to decide whether the cardiac symptoms are entirely due to old fibrosis of the valves, or whether there are fungating masses on the valves as well. Probably the additional symptoms most suggestive of the latter are—

Some pyrexia.
Multiple emboli.
Splenic enlargement.
Progressive anæmia.

(4.) That there is no sharp line of demarcation between simple and infective endocarditis; so that whereas some cases

of endocarditis are slight, and recover soon, and others are very severe, and die soon, a third group are on the border-line between the two, and may continue doubtful as to their prognosis for weeks and months ; and may even recover when they seemed certainly to have fungating endocarditis.

(5.) That pyrexia in the ordinary sense is not necessarily present although the patient is suffering from fungating endocarditis ; in which connection it is most important to remember that the natural body temperature in cases of old valvular heart-disease may be as low as 96·6° F., so that what may be normal temperatures in normal subjects may be actual pyrexia in them.